

## PATENT ABSTRACTS OF JAPAN

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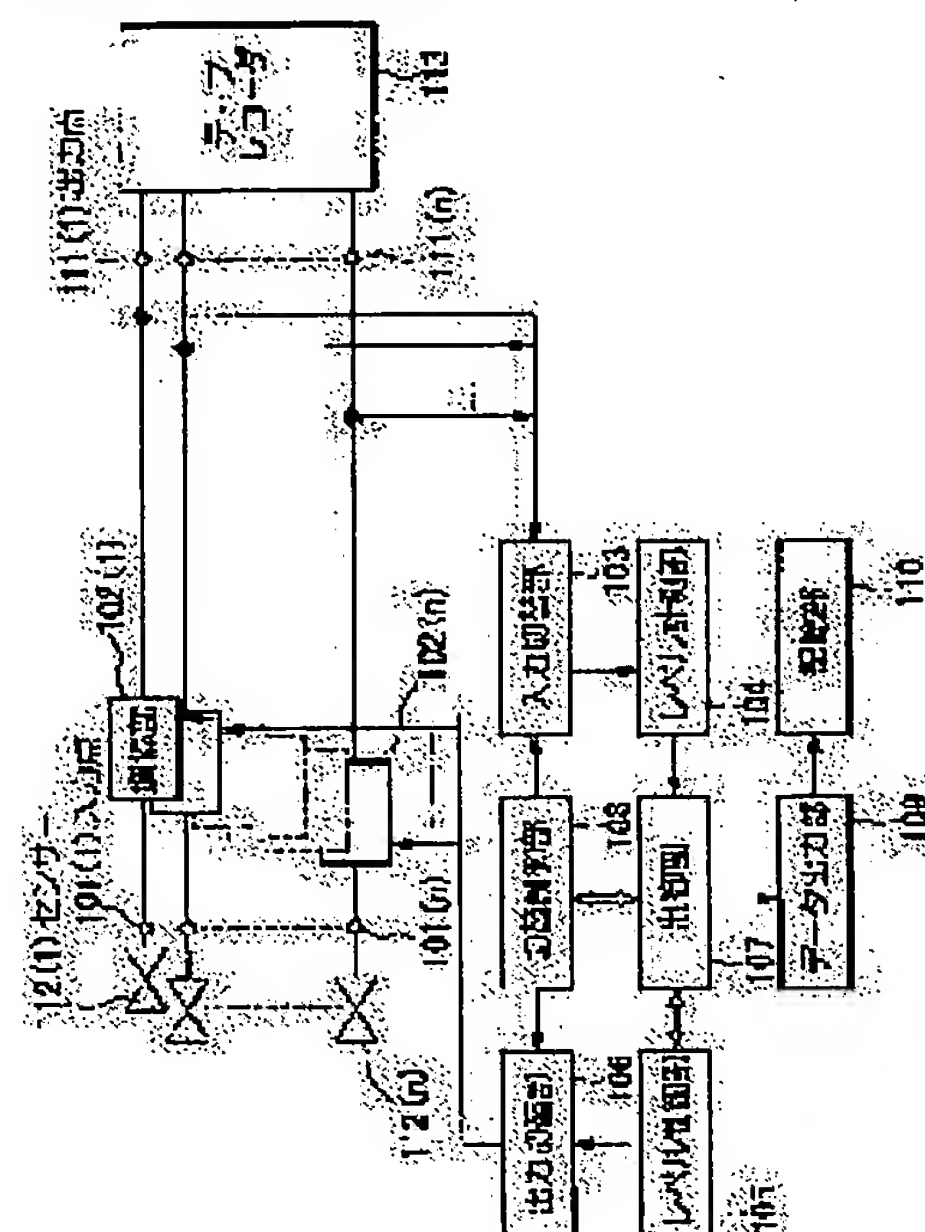
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## (54) CONTROL/RECORDING METHOD OF ACOUSTIC SIGNAL LEVEL AND ITS DEVICE

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To enable to detect correction data (gain adjusting value) of a level for calculating an absolute value of the input signal level when a recorded magnetic tape is reproduced, by correcting and holding the input level so that the input signal level to a recorder does not become too high or too low.

**SOLUTION:** By a changeover control part 108, a pertinent channel is selected from multichannel acoustic signal inputs, and the acoustic signal input level is measured by a level measuring part 104, and the level correcting value is calculated by a control part 107 based on the decision result of the comparison made between the measured value and an optionally set specific value. Then the level is corrected through a level control part 105, and the acoustic signal input level is again measured by the control part 107 to detect that it is within the specified value, and log data including the measured value and level correcting value are recorded on a recording part 110 by a data output part 109.



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CLAIMS

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[Claim(s)]

[Claim 1]It is used for an audible signal level control recorder which supervises an input level when recording an audible signal of many channels, and performs a level control of an amplifier, Choose an applicable channel from said audible signal input, and an acoustic signal input level is measured, Based on a decision result which compared a value of standard arbitrarily set to the measurement value, compute a level-adjusting value, and level adjusting is performed, An audible signal level control record method detecting that said acoustic signal input level is measured and it is in said value of standard again, recording log data containing the measurement value and a level-adjusting value, and changing said channel.

[Claim 2]The audible signal level control record method according to claim 1 recording log data containing the measurement value and level-adjusting value when it is out of said value of standard.

[Claim 3]The audible signal level control record method according to claim 1, wherein said log data contains further at least one of a channel and time information.

[Claim 4]An audible signal level control recorder which supervises an input level when recording an audible signal of many channels, and performs a level control of an amplifier, comprising:

A switching part which chooses an applicable channel from an audible signal input of said many channels.

A level measuring part which and measures an acoustic signal input level of a selected channel. [ a measuring part ]

A control section which compares a value of standard arbitrarily set to the measurement value, and judges necessity of level adjusting.

An outputting part which records log data containing the measurement value and a level-adjusting value when it is detected by a level control part which computes the correction value and performs level adjusting when judged with a level-adjusting important point, and said control section that said level measurement value is in a value of standard.

[Claim 5]The audible signal level control recorder according to claim 4, wherein said switching part contains further an output switching part which carries out the selection change of said amplifier.

[Claim 6]The audible signal level control recorder comprising according to claim 4:

An amplifying circuit where said amplifier performs a level control of an audible signal.

A level-adjusting value holding circuit which changes the level-adjusting value with a reset signal supplied via said output switching part when a former level-adjusting value is held and said level measurement value is judged to be substandard, even if it is a case where a level-adjusting signal is not newly inputted into said amplifying circuit.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to the audible signal level control record method and device which supervise the input signal level at the time of recording an audible signal on a recorder, and perform a level control.

[0002]

[Description of the Prior Art]An example of the conventional audible signal level control recorder is briefly explained with reference to drawing 5. To the device which plays behind the audible signal which is recorded on the magnetic tape of the tape recorder 503, and which was acquired from the sensor 505, and analyzes a sound level. Usually, the AGC (Auto Gain Control) circuit which controls automatically the level of too little [excessive or ] audible signal to magnetic tape is incorporated. However, since the control level was not recorded on magnetic tape, it was impossible to have analyzed a sound level in the case of playback.

[0003]That is, for the analysis of a sound level, it needed to be worked for adjustment by a help, and record. Do not use the AGC function of a tape recorder but the amplifier 502 (1-10) is specifically connected between the sensor 505 (1-10) and the tape recorder 503, It carries out by supervising the level meter 504 about whether the input level to each channel (CH1-CH10) of the tape recorder 503 is in optimal recording level within the limits. And the profit of the amplifier 502 (1-10) of a channel applicable when a sound level separates from the range was adjusted, the audible signal of the correct level was inputted into the tape recorder 503, and the work which records a gain setting value and setting-out time was needed further.

[0004]

[Problem(s) to be Solved by the Invention]As described above, conventionally, it will depend for the surveillance of the input level of a tape recorder, the optimal recording level maintenance of an input level and the gain control of an amplifier, and a gain setting value and record of setting-out time on a help, and when performing tuning of an input level simultaneously about many channels, it is accompanied by very complicated operation. Therefore, the cost escalation by authorized personnel's increase of the personnel was expected, and the reliability of record data fell by the human error, and the credibility of sound level analytical data had a question.

[0005]In light of the above-mentioned circumstances, this invention is a thing.

The purpose chooses an applicable channel from the audible signal input of \*\*, and measures an acoustic signal input level, Based on the decision result which compared the value of standard arbitrarily set to the measurement value, compute a level-adjusting value, and level adjusting is performed, By detecting that said acoustic signal input level is measured and it is in a value of standard again, and recording the log data containing the measurement value and a level-adjusting value, It is providing the audible signal level control record method and device which can perform a help on a \*\*\*\*\* automatic target about detection and record of a level control and a gain setting value.

[0006]

[Means for Solving the Problem]In order to solve the above-mentioned technical problem the audible signal level control record method according to claim 1, It is used for an audible signal level control recorder which supervises an input level when recording an audible signal of many channels, and performs a level control of an amplifier, Choose an applicable channel from said audible signal input, and an acoustic signal input level is measured, Based on a decision result which compared a value of standard arbitrarily set to the measurement

value, compute a level-adjusting value, and level adjusting is performed, It detects that said acoustic signal input level is measured and it is in said value of standard again, log data containing the measurement value and a level-adjusting value is recorded, and said channel is changed.

[0007]In the method according to claim 1, the audible signal level control record method according to claim 2 records log data containing the measurement value and level-adjusting value, when it is out of said value of standard. In the method according to claim 1, as for the audible signal level control record method according to claim 3, said log data contains further at least one of a channel and time information.

[0008]As described above, in order that this invention might compute an absolute value of an acoustic signal input level recorded on magnetic tape, an audible signal level control recorder which sets up the input level range of an audible signal arbitrarily, and controls it was formed instead of an AGC function of a recorder. In supplying an output to a recorder, by a basis of control of a control section. An input change, level measurement, a level control, and an output change are performed, level adjusting is performed to an amplifier connected with a sensor between recorders, log data which comprises a channel, time, level adjusting, and level data is outputted to a data output part, and it logs out to the Records Department. That is, analysis of a sound level is attained in the case of reproduction by arranging an audible signal level control recorder which performs detection and record of a level control and again setting value in the preceding paragraph of a recorder.

[0009]As for this invention, the audible signal level control recorder according to claim 4 is characterized by that an audible signal level control recorder which supervises an input level when recording an audible signal of many channels, and performs a level control of an amplifier comprises the following.

A switching part which chooses an applicable channel from an audible signal input of said many channels.

A level measuring part which and measures an acoustic signal input level of a selected channel. [ a measuring part ]

A control section which compares a value of standard arbitrarily set to the measurement value, and judges necessity of level adjusting.

An outputting part which records log data containing the measurement value and a level-adjusting value when it is detected by a level control part which computes the correction value and performs level adjusting when judged with a level-adjusting important point, and said control section that said level measurement value is in a value of standard.

[0010]The audible signal level control recorder according to claim 5 contains an output switching part to which said switching part carries out the selection change of said amplifier further in the device according to claim 4. The audible signal level control recorder according to claim 6 is [ this invention ] characterized by that the device according to claim 4 comprises the following further.

An amplifying circuit where said amplifier performs a level control of an audible signal.

A level-adjusting value holding circuit which changes the level-adjusting value with a reset signal supplied via said output switching part when a former level-adjusting value is held and said level measurement value is judged to be substandard, even if it is a case where a level-adjusting signal is not newly inputted into said amplifying circuit.

[0011]In composition mentioned above, when an audible signal is inputted into multi-channel part coincidence, an input signal is inputted into an input switching part via an amplifier. In an input switching part, it is chosen from a control section by one input switching signal directed to a switchover control part among multi-channel data, the input signal is measured by a level measuring part, and the level measurement value is sent out to a control section. In a control section, as compared with a level value of standard set up beforehand, if a result is substandard, a level-adjusting value is sent out to a level control part. In a level control part, it changes into a level-adjusting signal and a reset signal, and sends out to an output switching part. In an output switching part, a level-adjusting signal and a reset signal are sent out to an amplifier of the same channel as an input switching part, and gain correction is performed.

[0012]Next, in order to check \*\*\*\*\* [ correction results of a profit / in a standard ], again, via an input switching part, an input signal is re-measured by a level measuring part, and judges the inside and outside of a standard of an input signal level by a control section. If it is in a standard, it is to a data output part. Log data (measurement data and a channel, time information, amendment data) is sent out. In a data output part, log data is memorized one by one, and it sends out and logs out of record data to the Records Department. If gain



correction of the channel concerned is ended, in order to measure the following channel, an output switching signal is sent for an input switching signal to an input switching part via a switchover control part from a control section to an output switching part, and a channel is changed. It becomes possible by repeating a series of above operations to detect an absolute value of an input signal level from magnetic tape at the time of playback.

[0013]By this, the integrated management of profitable detection and record of a gain control value nothing in the conventional AGC which were cut can be carried out in a control section, Absolute value calculation of an acoustic signal input level recorded on magnetic tape is attained, can eliminate a human error by manual setting-out work etc., and reliability improves, and a sizable cut of cost is realizable.

[0014]

[Embodiment of the Invention]Drawing 1 is a block diagram showing the embodiment of the audible signal level control recorder of this invention. In a figure, 101 (1-n) is each input point which inputs into the audible signal level control recorder of this invention the audible signal for several channel number equivalent minutes acquired from the underwater sensor which detects marine and underwater sound as the sensor 112 (1-n), for example. 102 (1-n) is an amplifier. The amplifier 102 (1-n) receives the level-adjusting signal supplied via the output switching part 106, amplifies the audible signal level inputted, and supplies it to the tape recorder 113 via the output point 111 (1-n).

[0015]The outline composition of the amplifier 102 for one arbitrary channel is shown in drawing 2 (a) among the amplifiers 102 (1-n). The level-adjusting signal received from the output switching part 106 is sent to the amplifying circuit 211 having a gain level variable function via the level-adjusting value holding circuit 212. It outputs by fluctuating the level (input point 101) of an audible signal inputted by the amplifying circuit 211 (output point 111). Unless a reset signal is inputted into the level-adjusting value holding circuit 212 as for the renewal of a level-setting value, rewriting of the level-adjusting value to the amplifying circuit 211 is not performed, but holding former level-adjusting data is continued. That is, by sending a reset signal simultaneously with a level-adjusting signal from the output switching part 106, the level-adjusting value to the amplifying circuit 211 is updated.

[0016]Explanation is returned to drawing 1. 103 is an input switching part. As the outline composition is shown in drawing 2 (b), the input switching part 103 chooses an input channel from the input switching signal acquired from the switchover control part 108, and sends out the amplified signal acquired from the amplifier 102 (1-n) to the level measuring part 104. The level measuring part 104 measures the level of an amplified signal, and sends out the measurement value to the control section 107. Since it is common knowledge and is not directly related to this invention from the former about the level measuring part 104, explanation is omitted.

[0017]105 is a level control part. The level control part 105 sends out the level-adjusting value from the control section 107 to the output switching part 106 as a level-adjusting signal and a reset signal. 106 is an output switching part. As the outline composition is shown in drawing 2 (c), the output switching part 106 chooses an output channel with the output switching signal outputted via the switchover control part 108, and sends out the level-adjusting signal and reset signal which are acquired from the level control part 105 to each amplifier 102 (1-n). 107 is a control section. [ whether only when the control section 107 compares the value of standard beforehand set to the level measurement value and a result separates in a value of standard, a level-adjusting value is sent out to the data output part 109, and ] Or the value of standard beforehand set to the level measurement value is compared, and only when a result is in a standard, log data is sent out to the data output part 109. This is selection items. And an input-and-output switching signal is sent out to the following channel selections to the switchover control part 108.

[0018]108 is a switchover control part. The switchover control part 108 sends out an input switching signal and an output switching signal simultaneously with an input-and-output switching signal. 109 is a data output part. The data output part 109 points to memorizing log data to the Records Department 110, and also sends out record data. 110 is the Records Department. The Records Department 110 logs out of record data (printing). 111 (1-n) is an output point and becomes a final output stage of the audible signal level control recorder of this invention. 113 is a tape recorder and the audible signal control record device of this invention is formed in the preceding paragraph of this tape recorder 113.

[0019]Hereafter, operation of this invention embodiment shown in drawing 1 and drawing 2 is explained in detail. First, to the control section 107, a sensor input channel, channel switching time, the optimal input level (value of standard) to the tape recorder 113, and the amplifier 102 receive, respectively (1-n), and initial value setting of a profit default value and the initial channel of an input-and-output change is performed. The signal

outputted from the sensor 112 (1-n) is supplied to the input point 101 (1-n), and this signal is supplied to each of the amplifier 102 (1-n). At the amplifier 102 (1-n), a first-time profit is sent out at 0 dB. The input signal is supplied to the input switching part 103, and supplies the input signal of the channel 1 which is initial setting to the level measuring part 104 in the input switching part 103. In the level measuring part 104, the level measurement value of the supplied input signal is supplied to the control section 107. In the control section 107, the standard level and level measurement value which were set up beforehand are compared, and the necessity of level adjusting is judged. About amendment of the level, the outline is shown in drawing 3.

[0020]In drawing 3, (c) carries out graphical representation of the voltage waveform of the audible signal after level adjusting for the voltage waveform of the audible signal [ (a) and / (b) ] before level adjusting on a time-axis. The point of measurement is made into the output point 111 (1) of the amplifier 102 (1), and among a figure, the portion which indicated by shading is the value of standard set up beforehand, and sets all for example, to  $3 \times V_{pp}$  here. The acoustic input signal level of (a) is too expensive, and signs that it stores in a standard as shown in (c) are shown by since the acoustic input signal level of (b) is too low, when it repeats level adjusting.

[0021]If a signal level is in a standard here, log data (measurement data and a channel, time information, amendment data) will be supplied to the data output part 109. In the data output part 109, log data is memorized one by one, record data is sent out to the Records Department 110, and it logs out of the data. In parallel, by the control section 107, in about 10 seconds, in order to measure the acoustic input signal level of the following channel (channel 2), the input-and-output switching signal for an input-and-output change is sent out to the switchover control part 108. In the switchover control part 108, an input switching signal is sent out to the input switching part 103, and an output switching signal is simultaneously sent out to the output switching part 106, respectively. In the input switching part 103 and the output switching part 106, the directed channel (channel 2) is chosen, the input signal of the channel 2 is supplied to the level measuring part 104, a series of operations are performed about all the channels, and this is repeated.

[0022]When judged with a level measurement value being substandard in the control section 107, the computed level-adjusting value is supplied to the level control part 105. In the level control part 105, the level-adjusting signal and reset signal which were changed are supplied to the output switching part 106. In the output switching part 106, a level-adjusting signal and a reset signal are supplied to the amplifier 102 of a channel plane 1 this (1) chosen as initial setting. With the corresponding amplifier 102 (1) The directed level is amended. The correction value of a level is held till a next setting variation. Next, in order to check "whether the amended signal is in a standard", an input signal is again measured by the level measuring part 104 via the input switching part 103. Hereafter, a series of operations are performed by all the channels. This is repeated.

[0023]An applicable channel is chosen from the signal of many channels like explanation above, By carrying out level measurement, amending a level based on the decision result in comparison with the arbitrary values of standard specified beforehand, carrying out level measurement again, and performing memory and record of log data at the time within a standard, it cannot depend for detection and record of a gain setting value on a help, but they can be performed automatically.

[0024]Although the example which installs an audible signal level control recorder was stated to the preceding paragraph of the tape recorder 113, this invention embodiment mentioned above can be similarly applied, when using it only as a level monitor of an audible signal. The composition is shown in drawing 4. The embodiment shown in drawing 1 and the block to which identical codes were given are the same as it which shows drawing 1 among a figure. The level control part 105 and the output switching part 106 are not only contained, and others are the same. [ in / in the difference with the embodiment shown in drawing 1 / drawing 1 ]

[0025]As an application, by attaining the tape recorder 113 and unification, it is compact and operation can become a flexible device as an easy device about the audible signal level control recorder of this invention. By including in the personal computer which bundles up above-mentioned switchover control part 108, level control part 105, level measuring part 104, data output part 109, and control section 107, and is flexible, and performing management and control integrative, The tape recorder 113 and a function can be separated and the weight saving of tape recorder 113 itself can be achieved. This invention Although an input output level is always supervised and level measurement data and amendment data are recorded, the random scan function to record level measurement and amendment data for saving of a storage capacity and operating load reduction only in besides a standard level is also considered as one application.

[0026]

[Effect of the Invention]As explained above, this invention chooses an applicable channel from the audible

signal input of many channels, and measures an acoustic signal input level, Based on the decision result which compared the value of standard arbitrarily set to the measurement value, compute a level-adjusting value, and level adjusting is performed, A help can be performed on a \*\*\*\*\* automatic target about detection and record of a level control and a gain setting value by detecting that said acoustic signal input level is measured and it is in a value of standard again, and recording the log data containing the measurement value and a level-adjusting value.

[0027]According to this invention, with the audible signal level control recorder which allotted each function of absolute value detection of an acoustic input signal level, a level control, an input-and-output change, record of information, reproduction, and system control. By a control section, can perform the detection and record of a gain control value which could not be made in the conventional AGC integrative, and management and control by this. Absolute value calculation of the acoustic signal input level recorded on magnetic tape can be attained, the human errors by manual setting-out work etc. can be reduced, and improvement in reliability can be aimed at. It becomes possible to aim at sharp reduction of cost.

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TECHNICAL FIELD

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[Field of the Invention]This invention relates to the audible signal level control record method and device which supervise the input signal level at the time of recording an audible signal on a recorder, and perform a level control.

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PRIOR ART

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[Description of the Prior Art]An example of the conventional audible signal level control recorder is briefly explained with reference to drawing 5. To the device which plays behind the audible signal which is recorded on the magnetic tape of the tape recorder 503, and which was acquired from the sensor 505, and analyzes a sound level. Usually, the AGC (Auto Gain Control) circuit which controls automatically the level of too little [ excessive or ] audible signal to magnetic tape is incorporated. However, since the control level was not recorded on magnetic tape, it was impossible to have analyzed a sound level in the case of playback.

[0003]That is, for the analysis of a sound level, it needed to be worked for adjustment by a help, and record. Do not use the AGC function of a tape recorder but the amplifier 502 (1-10) is specifically connected between the sensor 505 (1-10) and the tape recorder 503, It carries out by supervising the level meter 504 about whether the input level to each channel (CH1-CH10) of the tape recorder 503 is in optimal recording level within the limits. And the profit of the amplifier 502 (1-10) of a channel applicable when a sound level separates from the range was adjusted, the audible signal of the correct level was inputted into the tape recorder 503, and the work which records a gain setting value and setting-out time was needed further.

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EFFECT OF THE INVENTION

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[Effect of the Invention]As explained above, in this invention, choose an applicable channel from the audible signal input of many channels, and an acoustic signal input level is measured, A level-adjusting value is computed based on the decision result which compared the value of standard arbitrarily set to the measurement value, level adjusting is performed, it detects that said acoustic signal input level is measured and it is in a value of standard again, and the log data containing the measurement value and a level-adjusting value is recorded.

Therefore, a help can be performed on a \*\*\*\* automatic target about detection and record of a level control and a gain setting value.

[0027]In this invention, with the audible signal level control recorder which allotted each function of absolute value detection of an acoustic input signal level, a level control, an input-and-output change, record of information, reproduction, and system control. Management and control can be performed for the detection and record of a gain control value which could not be made in the conventional AGC integrative by a control section, and it is this.

Absolute value calculation of the acoustic signal input level which was recorded [ \*\* ] for the reason can be attained, the human errors by manual setting-out work etc. can be reduced, and improvement in reliability can be aimed at.

It becomes possible to aim at sharp reduction of cost.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention]As described above, conventionally, it will depend for the surveillance of the input level of a tape recorder, the optimal recording level maintenance of an input level and the gain control of an amplifier, and a gain setting value and record of setting-out time on a help, and when performing tuning of an input level simultaneously about many channels, it is accompanied by very complicated operation. Therefore, the cost escalation by authorized personnel's increase of the personnel was expected, and the reliability of record data fell by the human error, and the credibility of sound level analytical data had a question.

[0005]In light of the above-mentioned circumstances, this invention is a thing.

The purpose chooses an applicable channel from the audible signal input of \*\*, and measures an acoustic signal input level, Based on the decision result which compared the value of standard arbitrarily set to the measurement value, compute a level-adjusting value, and level adjusting is performed, By detecting that said acoustic signal input level is measured and it is in a value of standard again, and recording the log data containing the measurement value and a level-adjusting value, It is providing the audible signal level control record method and device which can perform a help on a \*\*\*\* automatic target about detection and record of a level control and a gain setting value.

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**MEANS**

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[Means for Solving the Problem]In order to solve the above-mentioned technical problem the audible signal level control record method according to claim 1, It is used for an audible signal level control recorder which supervises an input level when recording an audible signal of many channels, and performs a level control of an amplifier, Choose an applicable channel from said audible signal input, and an acoustic signal input level is measured, Based on a decision result which compared a value of standard arbitrarily set to the measurement value, compute a level-adjusting value, and level adjusting is performed, It detects that said acoustic signal input level is measured and it is in said value of standard again, log data containing the measurement value and a level-adjusting value is recorded, and said channel is changed.

[0007]In the method according to claim 1, the audible signal level control record method according to claim 2 records log data containing the measurement value and level-adjusting value, when it is out of said value of standard. In the method according to claim 1, as for the audible signal level control record method according to claim 3, said log data contains further at least one of a channel and time information.

[0008]As described above, in order that this invention might compute an absolute value of an acoustic signal input level recorded on magnetic tape, an audible signal level control recorder which sets up the input level range of an audible signal arbitrarily, and controls it was formed instead of an AGC function of a recorder. In supplying an output to a recorder, by a basis of control of a control section. An input change, level measurement, a level control, and an output change are performed, level adjusting is performed to an amplifier connected with a sensor between recorders, log data which comprises a channel, time, level adjusting, and level data is outputted to a data output part, and it logs out to the Records Department. That is, analysis of a sound level is attained in the case of reproduction by arranging an audible signal level control recorder which performs detection and record of a level control and a gain setting value in the preceding paragraph of a recorder.

[0009]As for this invention, the audible signal level control recorder according to claim 4 is characterized by that an audible signal level control recorder which supervises an input level when recording an audible signal of many channels, and performs a level control of an amplifier comprises the following.

A switching part which chooses an applicable channel from an audible signal input of said many channels.

A level measuring part which and measures an acoustic signal input level of a selected channel. [ a measuring part ]

A control section which compares a value of standard arbitrarily set to the measurement value, and judges necessity of level adjusting.

An outputting part which records log data containing the measurement value and a level-adjusting value when it is detected by a level control part which computes the correction value and performs level adjusting when judged with a level-adjusting important point, and said control section that said level measurement value is in a value of standard.

[0010]The audible signal level control recorder according to claim 5 contains an output switching part to which said switching part carries out the selection change of said amplifier further in the device according to claim 4. The audible signal level control recorder according to claim 6 is [ this invention ] characterized by that the device according to claim 4 comprises the following further.

An amplifying circuit where said amplifier performs a level control of an audible signal.

A level-adjusting value holding circuit which changes the level-adjusting value with a reset signal supplied via said output switching part when a former level-adjusting value is held and said level measurement value is



judged to be substandard, even if it is a case where a level-adjusting signal is not newly inputted into said amplifying circuit.

[0011]In composition mentioned above, when an audible signal is inputted into multi-channel part coincidence, an input signal is inputted into an input switching part via an amplifier. In an input switching part, it is chosen from a control section by one input switching signal directed to a switchover control part among multi-channel data, the input signal is measured by a level measuring part, and the level measurement value is sent out to a control section. In a control section, as compared with a level value of standard set up beforehand, if a result is substandard, a level-adjusting value is sent out to a level control part. In a level control part, it changes into a level-adjusting signal and a reset signal, and sends out to an output switching part. In an output switching part, a level-adjusting signal and a reset signal are sent out to an amplifier of the same channel as an input switching part, and gain correction is performed.

[0012]Next, in order to check \*\*\*\*\* [ correction results of a profit / in a standard ], again, via an input switching part, an input signal is re-measured by a level measuring part, and judges the inside and outside of a standard of an input signal level by a control section. If it is in a standard, it is to a data output part. Log data (measurement data and a channel, time information, amendment data) is sent out. In a data output part, log data is memorized one by one, and it sends out and logs out of record data to the Records Department. If gain correction of the channel concerned is ended, in order to measure the following channel, an output switching signal is sent for an input switching signal to an input switching part via a switchover control part from a control section to an output switching part, and a channel is changed. It becomes possible by repeating a series of above operations to detect an absolute value of an input signal level from magnetic tape at the time of playback.

[0013]By this, the integrated management of profitable detection and record of a gain control value nothing in the conventional AGC which were cut can be carried out in a control section, Absolute value calculation of an acoustic signal input level recorded on magnetic tape is attained, can eliminate a human error by manual setting-out work etc., and reliability improves, and a sizable cut of cost is realizable.

[0014]

[Embodiment of the Invention]Drawing 1 is a block diagram showing the embodiment of the audible signal level control recorder of this invention. In a figure, 101 (1-n) is each input point which inputs into the audible signal level control recorder of this invention the audible signal for several channel number equivalent minutes acquired from the underwater sensor which detects marine and underwater sound as the sensor 112 (1-n), for example. 102 (1-n) is an amplifier. The amplifier 102 (1-n) receives the level-adjusting signal supplied via the output switching part 106, amplifies the audible signal level inputted, and supplies it to the tape recorder 113 via the output point 111 (1-n).

[0015]The outline composition of the amplifier 102 for one arbitrary channel is shown in drawing 2 (a) among the amplifiers 102 (1-n). The level-adjusting signal received from the output switching part 106 is sent to the amplifying circuit 211 having a gain level variable function via the level-adjusting value holding circuit 212. It outputs by fluctuating the level (input point 101) of an audible signal inputted by the amplifying circuit 211 (output point 111). Unless a reset signal is inputted into the level-adjusting value holding circuit 212 as for the renewal of a level-setting value, rewriting of the level-adjusting value to the amplifying circuit 211 is not performed, but holding former level-adjusting data is continued. That is, by sending a reset signal simultaneously with a level-adjusting signal from the output switching part 106, the level-adjusting value to the amplifying circuit 211 is updated.

[0016]Explanation is returned to drawing 1. 103 is an input switching part. As the outline composition is shown in drawing 2 (b), the input switching part 103 chooses an input channel from the input switching signal acquired from the switchover control part 108, and sends out the amplified signal acquired from the amplifier 102 (1-n) to the level measuring part 104. The level measuring part 104 measures the level of an amplified signal, and sends out the measurement value to the control section 107. Since it is common knowledge and is not directly related to this invention from the former about the level measuring part 104, explanation is omitted.

[0017]105 is a level control part. The level control part 105 sends out the level-adjusting value from the control section 107 to the output switching part 106 as a level-adjusting signal and a reset signal. 106 is an output switching part. As the outline composition is shown in drawing 2 (c), the output switching part 106 chooses an output channel with the output switching signal outputted via the switchover control part 108, and sends out the level-adjusting signal and reset signal which are acquired from the level control part 105 to

each amplifier 102 (1-n). 107 is a control section. . [ whether only when the control section 107 compares the value of standard beforehand set to the level measurement value and a result separates in a value of standard, a level-adjusting value is sent out to the data output part 109, and ] Or the value of standard beforehand set to the level measurement value is compared, and only when a result is in a standard, log data is sent out to the data output part 109. This is selection items. And an input-and-output switching signal is sent out to the following channel selections to the switchover control part 108.

[0018]108 is a switchover control part. The switchover control part 108 sends out an input switching signal and an output switching signal simultaneously with an input-and-output switching signal. 109 is a data output part. The data output part 109 points to memorizing log data to the Records Department 110, and also sends out record data. 110 is the Records Department. The Records Department 110 logs out of record data (printing). 111 (1-n) is an output point and becomes a final output stage of the audible signal level control recorder of this invention. 113 is a tape recorder and the audible signal control record device of this invention is formed in the preceding paragraph of this tape recorder 113.

[0019]Hereafter, operation of this invention embodiment shown in drawing 1 and drawing 2 is explained in detail. First, to the control section 107, a sensor input channel, channel switching time, the optimal input level (value of standard) to the tape recorder 113, and the amplifier 102 receive, respectively (1-n), and initial value setting of a profit default value and the initial channel of an input-and-output change is performed. The signal outputted from the sensor 112 (1-n) is supplied to the input point 101 (1-n), and this signal is supplied to each of the amplifier 102 (1-n). At the amplifier 102 (1-n), a first-time profit is sent out at 0 dB. The input signal is supplied to the input switching part 103, and supplies the input signal of the channel 1 which is initial setting to the level measuring part 104 in the input switching part 103. In the level measuring part 104, the level measurement value of the supplied input signal is supplied to the control section 107. In the control section 107, the standard level and level measurement value which were set up beforehand are compared, and the necessity of level adjusting is judged. About amendment of the level, the outline is shown in drawing 3.

[0020]In drawing 3, (c) carries out graphical representation of the voltage waveform of the audible signal after level adjusting for the voltage waveform of the audible signal [ (a) and / (b) ] before level adjusting on a time-axis. The point of measurement is made into the output point 111 (1) of the amplifier 102 (1), and among a figure, the portion which indicated by shading is the value of standard set up beforehand, and sets all for example, to  $3 \times V_{pp}$  here. The acoustic input signal level of (a) is too expensive, and signs that it stores in a standard as shown in (c) are shown by since the acoustic input signal level of (b) is too low, when it repeats level adjusting.

[0021]If a signal level is in a standard here, log data (measurement data and a channel, time information, amendment data) will be supplied to the data output part 109. In the data output part 109, log data is memorized one by one, record data is sent out to the Records Department 110, and it logs out of the data. In parallel, by the control section 107, in about 10 seconds, in order to measure the acoustic input signal level of the following channel (channel 2), the input-and-output switching signal for an input-and-output change is sent out to the switchover control part 108. In the switchover control part 108, an input switching signal is sent out to the input switching part 103, and an output switching signal is simultaneously sent out to the output switching part 106, respectively. In the input switching part 103 and the output switching part 106, the directed channel (channel 2) is chosen, the input signal of the channel 2 is supplied to the level measuring part 104, a series of operations are performed about all the channels, and this is repeated.

[0022]When judged with a level measurement value being substandard in the control section 107, the computed level-adjusting value is supplied to the level control part 105. In the level control part 105, the level-adjusting signal and reset signal which were changed are supplied to the output switching part 106. In the output switching part 106, a level-adjusting signal and a reset signal are supplied to the amplifier 102 of a channel plane 1 this (1) chosen as initial setting. With the corresponding amplifier 102 (1) The directed level is amended. The correction value of a level is held till a next setting variation. Next, in order to check "whether the amended signal is in a standard", an input signal is again measured by the level measuring part 104 via the input switching part 103. Hereafter, a series of operations are performed by all the channels. This is repeated.

[0023]An applicable channel is chosen from the signal of many channels like explanation above, By carrying out level measurement, amending a level based on the decision result in comparison with the arbitrary values of standard specified beforehand, carrying out level measurement again, and performing memory and record of log data at the time within a standard, it cannot depend for detection and record of a gain setting value on a help, but they can be performed automatically.

[0024]Although the example which installs an audible signal level control recorder was stated to the preceding paragraph of the tape recorder 113, this invention embodiment mentioned above can be similarly applied, when using it only as a level monitor of an audible signal. The composition is shown in drawing 4. The embodiment shown in drawing 1 and the block to which identical codes were given are the same as it which shows drawing 1 among a figure. The level control part 105 and the output switching part 106 are not only contained, and others are the same. [ in / in the difference with the embodiment shown in drawing 1 / drawing 1 ]

[0025]As an application, by attaining the tape recorder 113 and unification, it is compact and operation can become a flexible device as an easy device about the audible signal level control recorder of this invention. By including in the personal computer which bundles up above-mentioned switchover control part 108, level control part 105, level measuring part 104, data output part 109, and control section 107, and is flexible, and performing management and control integrative, The tape recorder 113 and a function can be separated and the weight saving of tape recorder 113 itself can be achieved. This invention Although an input output level is always supervised and level measurement data and amendment data are recorded, the random scan function to record level measurement and amendment data for saving of a storage capacity and operating load reduction only in besides a standard level is also considered as one application.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]It is a block diagram showing the embodiment of this invention.

[Drawing 2]It is a figure showing the internal configuration of the amplifier shown in drawing 1, an input switching part, and an output switching part.

[Drawing 3]It is a figure showing the outline of level adjusting used in this invention.

[Drawing 4]It is a block diagram showing other embodiments of this invention.

[Drawing 5]It is a block diagram showing the example of a level control of the conventional audible signal level monitoring instrument.

[Description of Notations]

101,101 (1-n) input point, 102,102 (1-n) amplifiers, 103 input switching parts, a 104 level measuring part, 105 level control parts, a 106 output switching part, 107 control sections, 108 switchover control parts, 109 data output parts, the 110 Records Department, 111,111 (1-n) output points, 112,112 (1-n) sensors, 113 tape recorders, 211 amplifying circuits, a 212 level-adjusting value holding circuit

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[Translation done.]



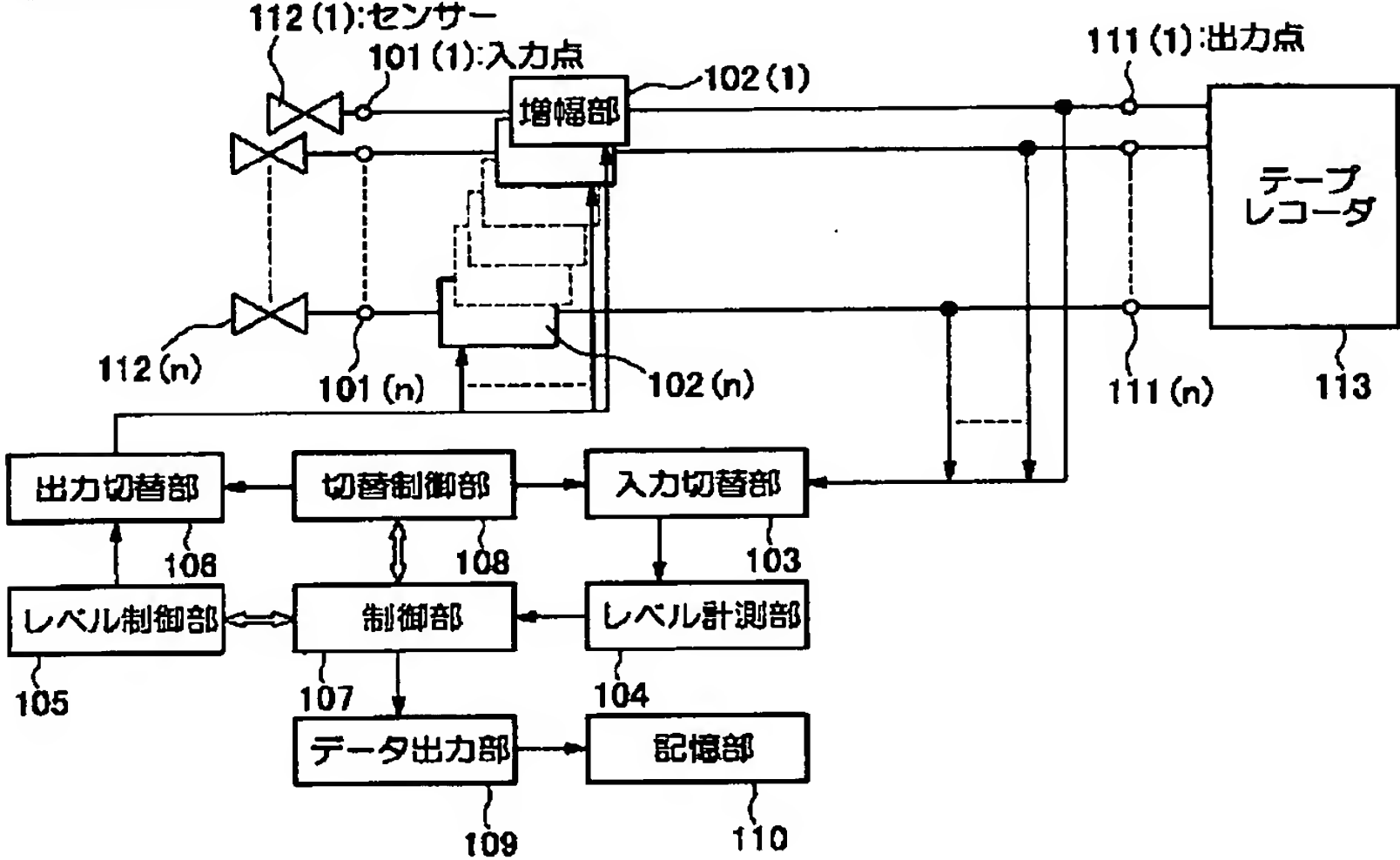
\* NOTICES \*

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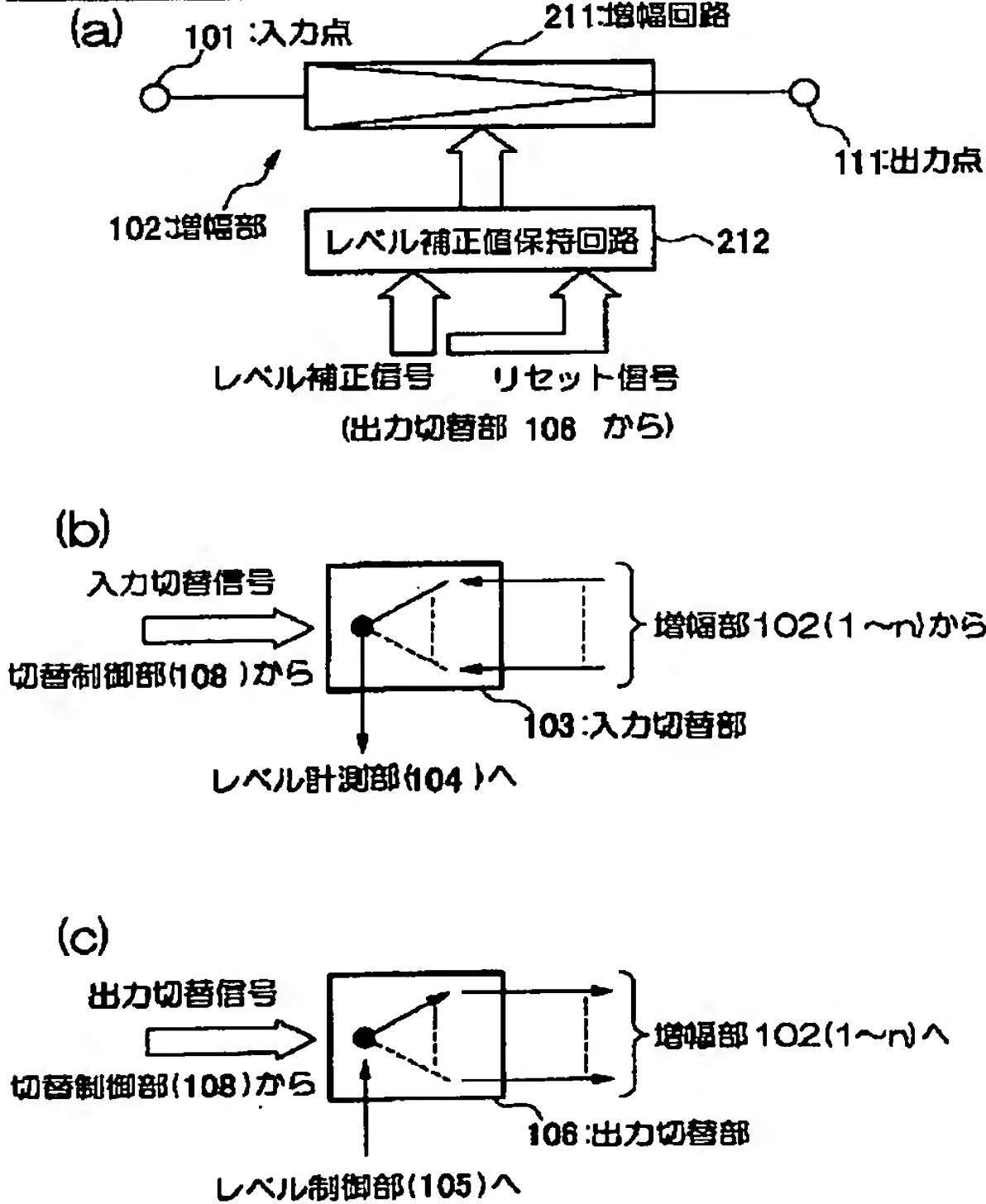
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DRAWINGS

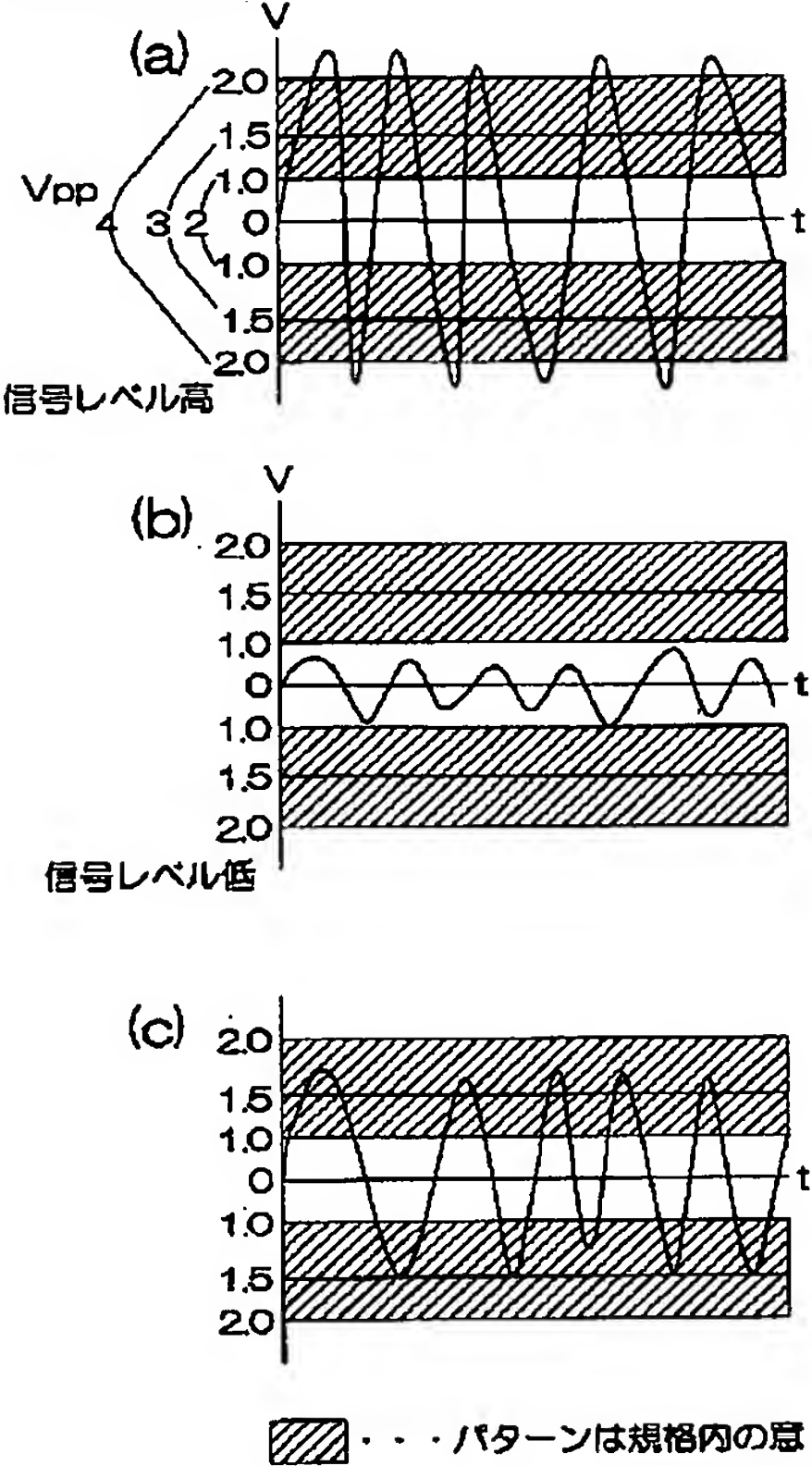
[Drawing 1]



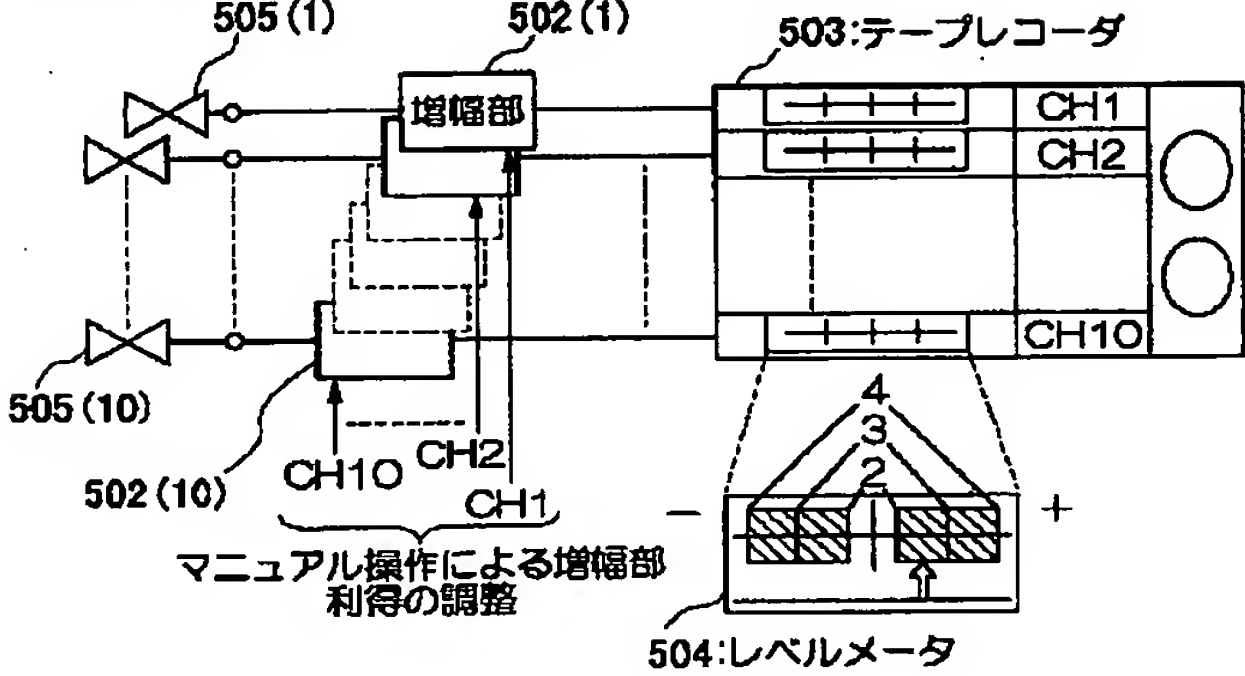
[Drawing 2]



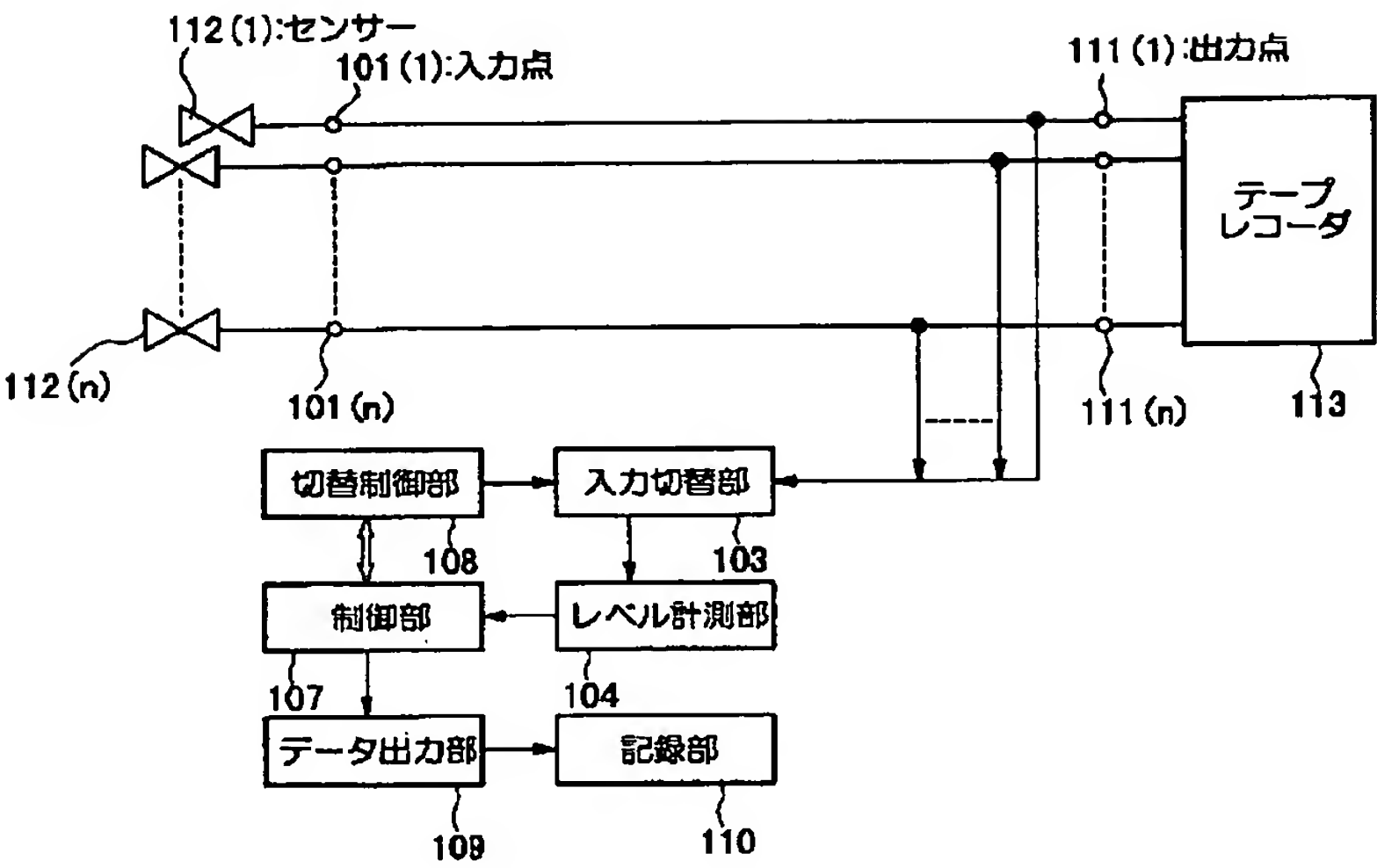
[Drawing 3]



[Drawing 5]



[Drawing 4]



[Translation done.]

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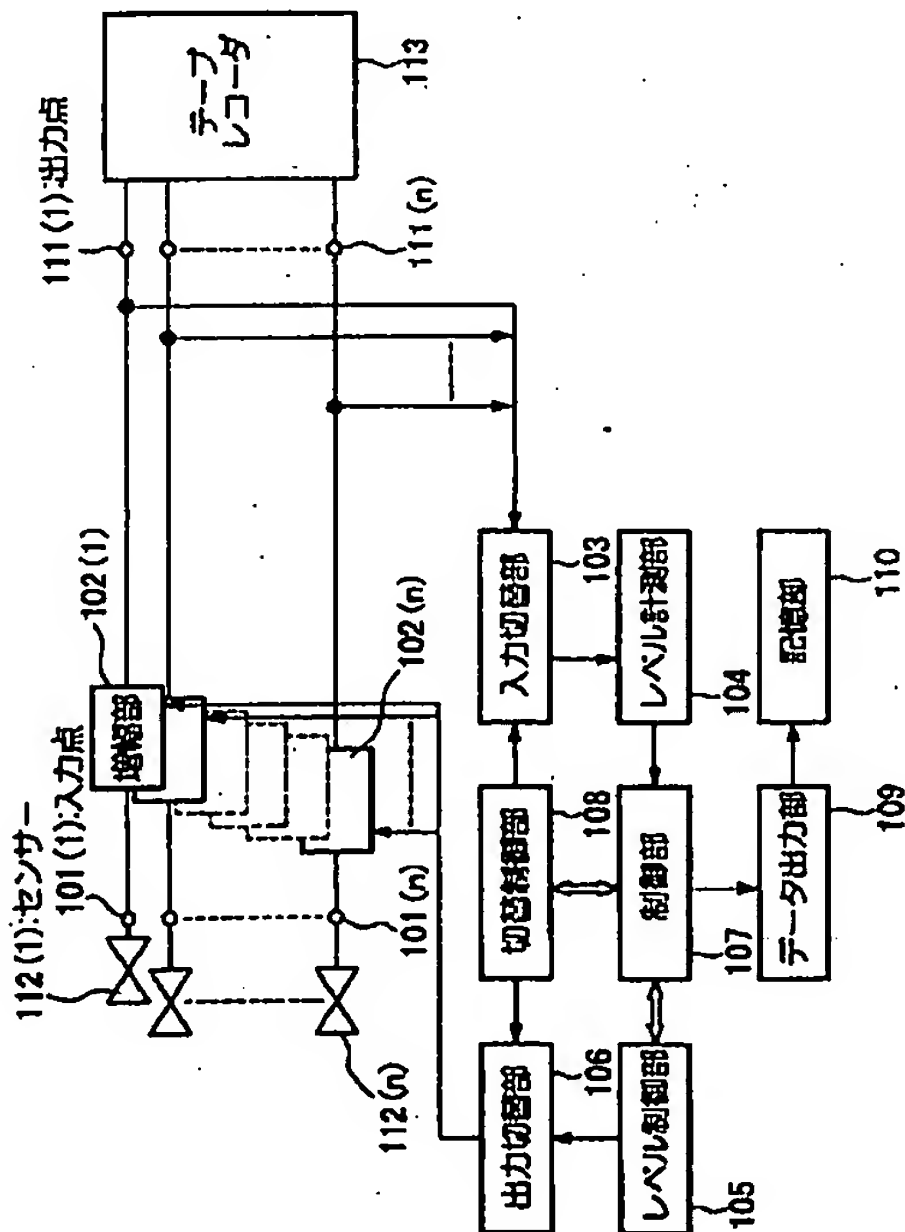
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(54)【発明の名称】 音響信号レベル制御記録方法ならびに装置

(57)【要約】

【課題】 レコーダへの入力信号レベルが過大、過小にならない様入力レベルを補正、保持し、記録された磁気テープを再生した時に入力信号レベルの絶対値を算出するためにレベルの補正データ（利得調整値）を検出できるようにする。

【解決手段】 切替え制御部108は、多チャネルの音響信号入力から該当チャネルを選択し、レベル計測部104により音響信号入力レベルの計測を行い、制御部107でその計測値と任意に設定される規格値とを比較した判定結果に基づきレベル補正値を算出する。そして、レベル制御部105を介してレベル補正を行い、制御部107は、再度、前記音響信号入力レベルの計測を行って規格値内にあることを検出し、データ出力部109がその計測値、レベル補正値を含むログデータを記録部110に記録する





## 【特許請求の範囲】

【請求項1】 多チャネルの音響信号を記録するときの入力レベルを監視して増幅部のレベル制御を行う音響信号レベル制御記録装置に用いられ、

前記音響信号入力から該当チャネルを選択して音響信号入力レベルの計測を行い、

その計測値と任意に設定される規格値とを比較した判定結果に基づきレベル補正値を算出してレベル補正を行い、

再度、前記音響信号入力レベルの計測を行って前記規格値内にあることを検出し、その計測値、レベル補正値を含むログデータを記録し、前記チャネルを切替ること、を特徴とする音響信号レベル制御記録方法。

【請求項2】 前記規格値外にあるときに、その計測値とレベル補正値を含むログデータを記録することを特徴とする請求項1に記載の音響信号レベル制御記録方法。

【請求項3】 前記ログデータは、チャネル、時刻データのうちの少なくとも一つを更に含むことを特徴とする請求項1に記載の音響信号レベル制御記録方法。

【請求項4】 多チャネルの音響信号を記録するときの入力レベルを監視して増幅部のレベル制御を行う音響信号レベル制御記録装置において、

前記多チャネルの音響信号入力から該当チャネルを選択する切替部と、

都度、選択されたチャネルの音響信号入力レベルの計測を行うレベル計測部と、その計測値と任意に設定される規格値とを比較してレベル補正の要否を判定する制御部と、

レベル補正要と判定されたときにその補正値を算出してレベル補正を行うレベル制御部と、

前記制御部によって前記レベル計測値が規格値内にあることが検出されたとき、その計測値、レベル補正値を含むログデータを記録する出力部と、

を有することを特徴とする音響信号レベル制御記録装置。

【請求項5】 前記切替部は、更に、前記増幅部を選択切替する出力切替部を含むことを特徴とする請求項4に記載の音響信号レベル制御記録装置。

【請求項6】 前記増幅部は、音響信号のレベル制御を行う増幅回路と、前記増幅回路に新たにレベル補正信号が入力されない場合であっても以前のレベル補正値を保持し、前記レベル計測値を規格外と判定したときに、前記出力切替部を介して供給されるリセット信号によりそのレベル補正値を変更するレベル補正値保持回路と、を有することを特徴とする請求項4に記載の音響信号レベル制御記録装置。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】 本発明は、音響信号をレコー

ダに記録する際の入力信号レベルを監視してレベル制御を行う、音響信号レベル制御記録方法ならびに装置に関する。

## 【0002】

【従来の技術】 従来の音響信号レベル制御記録装置の一例について、図5を参照して簡単に説明する。テープレコーダ503の磁気テープに記録される、センサー505から得られた音響信号を、後に再生し音響レベルを解析する装置には、通常、磁気テープへの過大、あるいは過小な音響信号のレベルを自動的に制御するAGC (Auto Gain Control) 回路が組み込まれている。しかしながら、磁気テープには、その制御レベルが記録されないため、再生の際に音響レベルの解析を行うことは不可能であった。

【0003】 即ち、音響レベルの解析のためには、人手による調整、記録のための作業が必要であった。具体的には、テープレコーダのAGC機能を使用せず、センサー505 (1~10) とテープレコーダ503の間に増幅部502 (1~10) を接続し、テープレコーダ503の各チャネル (CH1~CH10) への入力レベルが最適録音レベル範囲内にあるか否かについてレベルメータ504を監視することによって行う。そして、音響レベルがその範囲を外れた時に該当するチャネルの増幅部502 (1~10) の利得を調整し、適正レベルの音響信号をテープレコーダ503へ入力し、更に、利得設定値及び設定時刻を記録する作業を必要としていた。

## 【0004】

【発明が解決しようとする課題】 上記したように、従来、テープレコーダの入力レベルの監視、入力レベルの最適録音レベル保持及び増幅部の利得調整、利得設定値と設定時刻の記録は、人手に頼ることになり、多チャネルについて同時に入力レベルの調整作業を行う場合は非常に複雑な操作を伴う。従って、作業員の増員によるコスト増大が予想され、また、ヒューマンエラーにより記録データの信頼性が低下し、音響レベル解析データの信頼性に疑問があった。

【0005】 本発明は上記事情に鑑みてなされたものであり、多チャネルの音響信号入力から該当チャネルを選択して音響信号入力レベルの計測を行い、その計測値と任意に設定される規格値とを比較した判定結果に基づきレベル補正値を算出してレベル補正を行い、再度、前記音響信号入力レベルの計測を行って規格値内にあることを検出し、その計測値、レベル補正値を含むログデータを記録することにより、レベル制御及び利得設定値の検出と記録に関し、人手を要せず自動的に行なうことのできる、音響信号レベル制御記録方法ならびに装置を提供することを目的とする。

## 【0006】

【課題を解決するための手段】 上記した課題を解決するために請求項1に記載の音響信号レベル制御記録方法

は、多チャネルの音響信号を記録するときの入力レベルを監視して増幅部のレベル制御を行う音響信号レベル制御記録装置に用いられ、前記音響信号入力から該当チャネルを選択して音響信号入力レベルの計測を行い、その計測値と任意に設定される規格値とを比較した判定結果に基づきレベル補正値を算出してレベル補正を行い、再度、前記音響信号入力レベルの計測を行って前記規格値内にあることを検出し、その計測値、レベル補正値を含むログデータを記録し、前記チャネルを切替えることを特徴とする。

【0007】また、請求項2に記載の音響信号レベル制御記録方法は、請求項1に記載の同方法において、前記規格値外にあるときに、その計測値とレベル補正値を含むログデータを記録することを特徴とする。更に、請求項3に記載の音響信号レベル制御記録方法は、請求項1に記載の同方法において、前記ログデータは、チャネル、時刻データのうちの少なくとも一つを更に含むことを特徴とする。

【0008】上記したように、本発明は、磁気テープに記録された音響信号入力レベルの絶対値を算出するために、レコーダのAGC機能の代わりに、音響信号の入力レベル範囲を任意に設定して制御する音響信号レベル制御記録装置を設けたことを特徴とする。レコーダへ出力を供給するにあたり、制御部のコントロールの基で、入力切替、レベル計測、レベル制御、出力切替を行い、センサとレコーダ間に接続される増幅部に対してレベル補正を行い、チャネル、時刻、レベル補正、レベルデータから成るログデータをデータ出力部に出力し、記録部にログアウトする。つまり、レコーダの前段にレベル制御及び利得設定値の検出と記録を行う音響信号レベル制御記録装置を配することにより、再生の際に音響レベルの解析が可能になる。

【0009】請求項4に記載の音響信号レベル制御記録装置は、多チャネルの音響信号を記録するときの入力レベルを監視して増幅部のレベル制御を行う音響信号レベル制御記録装置において、前記多チャネルの音響信号入力から該当チャネルを選択する切替部と、都度、選択されたチャネルの音響信号入力レベルの計測を行うレベル計測部と、その計測値と任意に設定される規格値とを比較してレベル補正の要否を判定する制御部と、レベル補正要と判定されたときにその補正値を算出してレベル補正を行うレベル制御部と、前記制御部によって前記レベル計測値が規格値内にあることが検出されたとき、その計測値、レベル補正値を含むログデータを記録する出力部とを有することを特徴とする。

【0010】また、請求項5に記載の音響信号レベル制御記録装置は、請求項4に記載の同装置において、前記切替部は、更に、前記増幅部を選択切替する出力切替部を含むことを特徴とする。更に、請求項6に記載の音響信号レベル制御記録装置は、請求項4に記載の同装置に

において、前記増幅部は、音響信号のレベル制御を行う増幅回路と、前記増幅回路に新たにレベル補正信号が入力されない場合であっても以前のレベル補正値を保持し、前記レベル計測値を規格外と判定したときに、前記出力切替部を介して供給されるリセット信号によりそのレベル補正値を変更するレベル補正値保持回路とを有することを特徴とする。

【0011】上述した構成において、多チャネル分同時に音響信号が入力された時、増幅部を経由して入力信号が入力切替部へ入力される。入力切替部では、多チャネルデータのうち制御部から切替制御部へ指示された入力切替信号により、1個選択され、その入力信号をレベル計測部で計測し、そのレベル計測値を制御部へ送出する。制御部では予め設定されたレベル規格値と比較し、結果が規格外であればレベル制御部へレベル補正値を送出する。レベル制御部ではレベル補正信号、リセット信号に変換し出力切替部へ送出する。出力切替部では、レベル補正信号、リセット信号を入力切替部と同じチャネルの増幅部へ送出し利得補正を行う。

【0012】次に、利得の補正結果が規格内か否か確認するため、再度入力信号は入力切替部を経由し、レベル計測部で再計測し、制御部で入力信号レベルの規格内外を判定する。規格内であれば、データ出力部へログデータ（測定データ及びチャネル、時刻データ、補正データ）を送出する。データ出力部ではログデータを逐次記憶し、記録部へ記録データを送出し、ログアウトする。当該チャネルの利得補正を終了したならば、次チャネルの計測を行うために、制御部から切替制御部経由で入力切替信号を入力切替部に、出力切替信号を出力切替部へ送付し、チャネルの切替を行う。以上の一連の動作を繰り返すことにより再生時の磁気テープからの入力信号レベルの絶対値を検出することが可能になる。

【0013】このことにより、従来のAGCではなし得なかった利得調整値の検出と記録を制御部で統合管理でき、磁気テープに記録された音響信号入力レベルの絶対値算出が可能となり、マニュアル設定作業等によるヒューマンエラーをなくすることができ、信頼性が向上すると共に、コストの大幅削減を実現できる。

【0014】

【発明の実施の形態】図1は本発明の音響信号レベル制御記録装置の実施形態を示すブロック図である。図において、101(1~n)は、センサ112(1~n)として、例えば、海上及び水中音響を感知する水中センサから得られる、チャネル数相当数分の音響信号を本発明の音響信号レベル制御記録装置に入力するそれぞれの入力点である。102(1~n)は増幅部である。増幅部102(1~n)は、出力切替部106を介して供給されるレベル補正信号を受信し、入力される音響信号レベルを増幅し、出力点111(1~n)を介してテープレコーダ113に供給する。



【0015】増幅部102 (1~n)のうち、任意の1チャンネル分の増幅部102の概略構成を図2(a)に示す。出力切替部106から受信したレベル補正信号は、レベル補正值保持回路212を経由し、利得レベル可変機能を併せ持った増幅回路211へ送られる。増幅回路211により入力された音響信号のレベル(入力点101)を変動させ出力(出力点111)する。また、レベル設定値の更新はレベル補正值保持回路212にリセット信号が入力されない限り、増幅回路211へのレベル補正值の書き換えは行われず、以前のレベル補正データを保持し続ける。つまり出力切替部106からレベル補正信号と同時にリセット信号が送られてくることにより、増幅回路211へのレベル補正值は更新される。

【0016】説明を図1に戻す。103は入力切替部である。入力切替部103は、図2(b)にその概略構成が示されるように、切替制御部108から得られる入力切替信号より入力チャンネルを選択し、増幅部102 (1~n)から得られる増幅信号をレベル計測部104へ送出する。レベル計測部104は、増幅信号のレベルを計測し、その計測値を制御部107へ送出する。レベル計測部104については従来から周知であり、本発明と直接関係しないため説明は省略する。

【0017】105はレベル制御部である。レベル制御部105は、制御部107からのレベル補正值をレベル補正信号、リセット信号として出力切替部106へ送出する。106は出力切替部である。出力切替部106は、図2(c)にその概略構成が示されるように、切替制御部108を介して出力される出力切替信号により出力チャンネルを選択し、レベル制御部105から得られるレベル補正信号、リセット信号を各増幅部102 (1~n)へ送出する。107は制御部である。制御部107は、レベル計測値と予め設定された規格値を比較し、結果が規格値に外れる場合のみレベル補正值をデータ出力部109へ送出するか、あるいは、レベル計測値と予め設定された規格値を比較し結果が規格内の場合のみログデータをデータ出力部109へ送出する。これは選択事項である。そして、切替制御部108に対して次チャンネル選択用に入出力切替信号を送出する。

【0018】108は切替制御部である。切替制御部108は、入出力切替信号により入力切替信号、出力切替信号を同時に送出する。109はデータ出力部である。データ出力部109は、記録部110に対してログデータを記憶することを指示し、更に記録データの送出を行う。110は記録部である。記録部110は、記録データをログアウト(印刷)する。111 (1~n)は出力点であり、本発明の音響信号レベル制御記録装置の最終出力段となる。113はテーブルコーダであり、本発明の音響信号制御記録装置は、このテーブルコーダ113の前段に設けられる。

【0019】以下、図1、図2に示す本発明実施形態の

動作について詳細に説明する。まず、制御部107に対して、センサー入力チャンネル、チャンネル切替時間、テーブルコーダ113への最適入力レベル(規格値)、増幅部102のそれぞれ(1~n)に対して利得デフォルト値、及び入出力切替初期チャンネルの初期値設定を行う。センサー112 (1~n)から出力される信号は、入力点101 (1~n)へ供給され、この信号が増幅部102 (1~n)のそれぞれに供給される。増幅部102 (1~n)では、初回の利得を0dBで送出する。その入力信号が入力切替部103へ供給され、入力切替部103では、初期設定である、例えばチャンネル1の入力信号をレベル計測部104へ供給する。レベル計測部104では、供給された入力信号のレベル計測値を制御部107へ供給する。制御部107では、予め設定された規格レベルとレベル計測値を比較し、レベル補正の要否の判定を行う。レベルの補正については図3にその概要が示されている。

【0020】図3において、(a)(b)はレベル補正前における音響信号の電圧波形を、(c)はレベル補正後の音響信号の電圧波形を時間軸上にグラフ表示したものである。いずれも測定点を増幅部102 (1)の出力点111 (1)とし、図中、網掛け表示した部分はあらかじめ設定された規格値であり、ここでは例えば、 $3 \pm V_{pp}$ とする。(a)は音響入力信号レベルが高すぎ、(b)は音響入力信号レベルが低すぎるため、レベル補正を繰り返すことによって(c)に示すように規格内に収める様子が示されている。

【0021】ここで信号レベルが規格内であれば、ログデータ(測定データ及びチャンネル、時刻データ、補正データ)をデータ出力部109へ供給する。データ出力部109では、ログデータを逐次記憶し、記録データを記録部110へ送出し、そのデータをログアウトする。また、並行して、制御部107では約10秒後、次のチャンネル(チャンネル2)の音響入力信号レベルを測定するために、切替制御部108に対し入出力切替用の入出力切替信号を送出する。切替制御部108では入力切替部103へ入力切替信号を、出力切替部106へ出力切替信号をそれぞれ同時に送出する。入力切替部103及び出力切替部106では、指示されたチャンネル(チャンネル2)を選択し、チャンネル2の入力信号をレベル計測部104へ供給し、一連の動作を全チャンネルについて行い、これを繰り返す。

【0022】尚、制御部107でレベル計測値が規格外であると判定されたときは、算出したレベル補正值をレベル制御部105へ供給する。レベル制御部105では変換したレベル補正信号、リセット信号を、出力切替部106へ供給する。出力切替部106では、初期設定として選択されているチャンネル1相当の増幅部102

(1)にレベル補正信号、リセット信号を供給する。対応する増幅部102 (1)では指示されたレベルの補

正を行う。尚、レベルの補正值は次回の設定変更時まで保持される。次に、「補正された信号が規格内であるか」を確認するため、再度入力切替部103を経由し、レベル計測部104で入力信号の計測を行う。以下、一連の動作を全チャンネル分行う。これを繰り返す。

【0023】以上説明のように、多チャンネルの信号から該当チャンネルを選択して、レベル計測して、あらかじめ規定される任意の規格値と比較した判定結果に基づきレベルの補正を行い、再度レベル計測し、規格内のときにログデータの記憶と記録を行うことにより、利得設定値

の検出と記録を人手に頼らず自動で行うことができる。【0024】尚、上述した本発明実施形態は、テープレコーダ113の前段に音響信号レベル制御記録装置を設置する例について述べたが、音響信号のレベルモニタとしてのみ使用する場合においても同様に適用できる。その構成を図4に示す。図中、図1に示す実施形態と同一符号が付されたブロックは図1に示すそれと同じである。図1に示す実施形態との差異は、図1におけるレベル制御部105と出力切替部106が含まれないだけであり、他は同様である。

【0025】応用例として、本発明の音響信号レベル制御記録装置をテープレコーダ113と一体化を図ることにより、コンパクトで操作が容易な装置として、汎用性のある装置になりうる。また、上記した切替制御部108、レベル制御部105、レベル計測部104、データ出力部109、制御部107を一括して汎用性のあるパーソナルコンピュータに組み込み、統合的に管理、制御を行うことによって、テープレコーダ113と機能を分離でき、テープレコーダ113そのものの軽量化をはかることが出来る。更に、本発明は常時入出力レベルを監視し、レベル測定データ、補正データを記録しているが、記憶容量の節約及び作動負荷低減のために規格レベル外の場合のみ、レベル計測及び補正データを記録するランダムスキャン機能も一つの応用として考えられる。

【0026】

【発明の効果】以上説明したように本発明は、多チャネ

ルの音響信号入力から該当チャンネルを選択して音響信号入力レベルの計測を行い、その計測値と任意に設定される規格値とを比較した判定結果に基づきレベル補正值を算出してレベル補正を行い、再度、前記音響信号入力レベルの計測を行って規格値内にあることを検出し、その計測値、レベル補正值を含むログデータを記録することにより、レベル制御及び利得設定値の検出と記録に関し人手を要せず自動的に行なうことができる。

【0027】本発明によれば、音響入力信号レベルの絶対値検出、レベル制御、入出力切替、情報の記録、再生およびシステム制御の各機能を配した音響信号レベル制御記録装置により、従来のAGCではなしえなかった利得調整値の検出と記録を制御部で統合的に管理、制御を行うことができ、このことにより、磁気テープに記録された音響信号入力レベルの絶対値算出が可能となり、マニュアル設定作業等によるヒューマンエラーを削減し、信頼性の向上をはかることができる。また、コストの大幅な低減を図ることが可能となる。

【図面の簡単な説明】

【図1】 本発明の実施形態を示すブロック図である。

【図2】 図1に示す増幅部、入力切替部、出力切替部の内部構成を示す図である。

【図3】 本発明において使用されるレベル補正の概要を示す図である。

【図4】 本発明の他の実施形態を示すブロック図である。

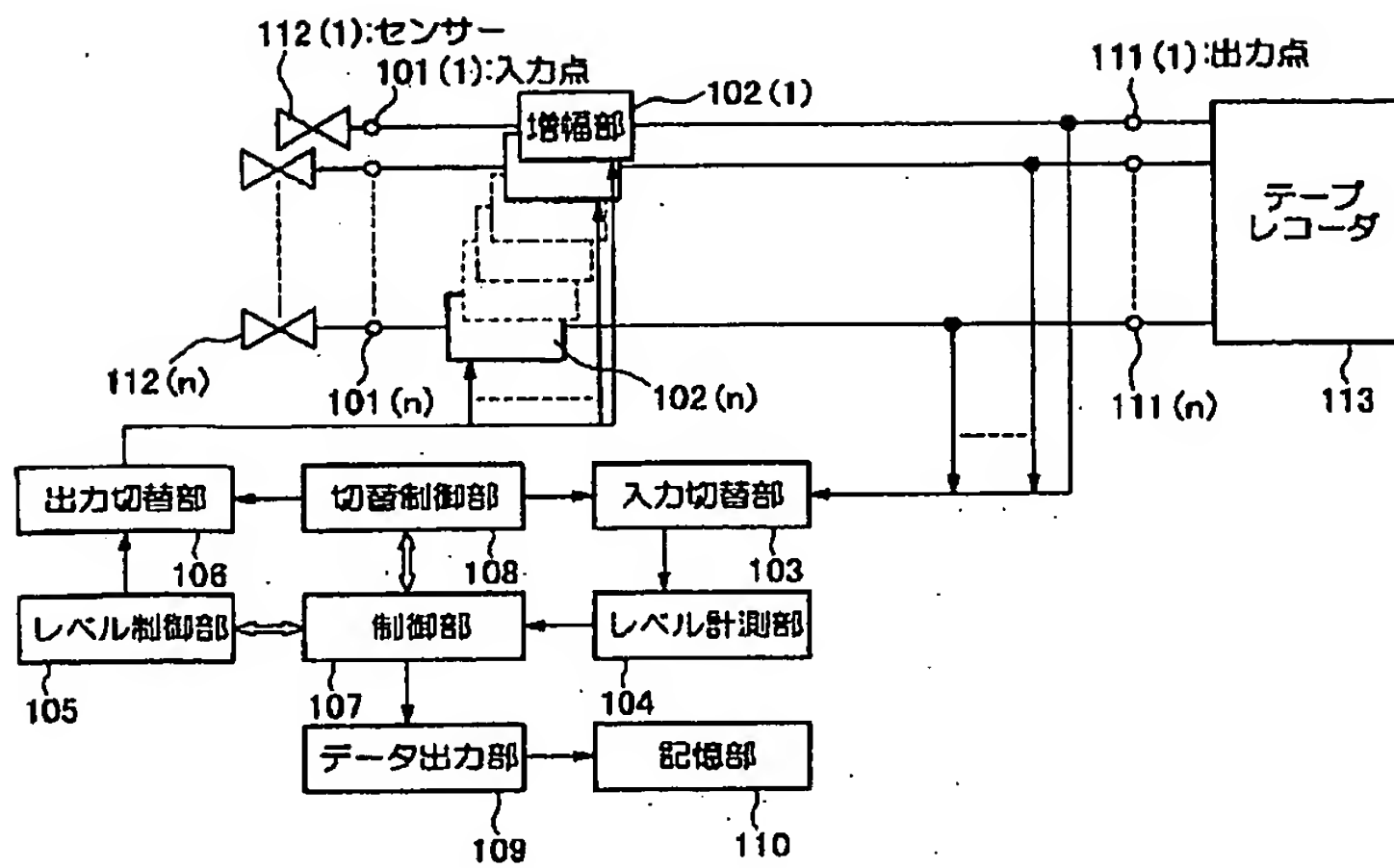
【図5】 従来の音響信号レベル監視装置のレベル制御例を示すブロック図である。

【符号の説明】

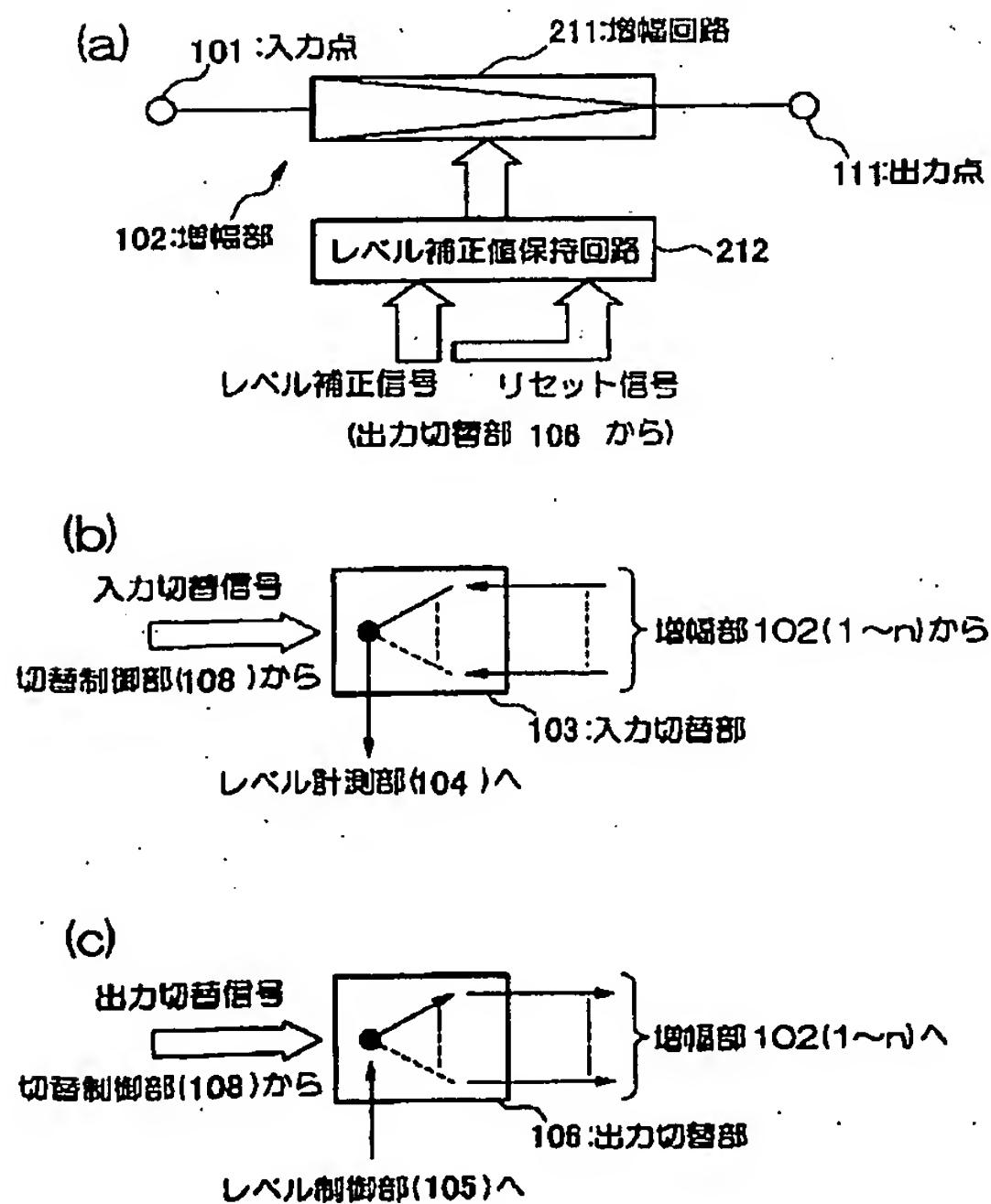
101, 101(1~n)入力点、102, 102(1~n)増幅部、103入力切替部、104レベル計測部、105レベル制御部、106出力切替部、107制御部、108切替制御部、109データ出力部、110記録部、111, 111(1~n)出力点、112, 112(1~n)センサー、113テープレコーダ、211増幅回路、212レベル補正值保持回路



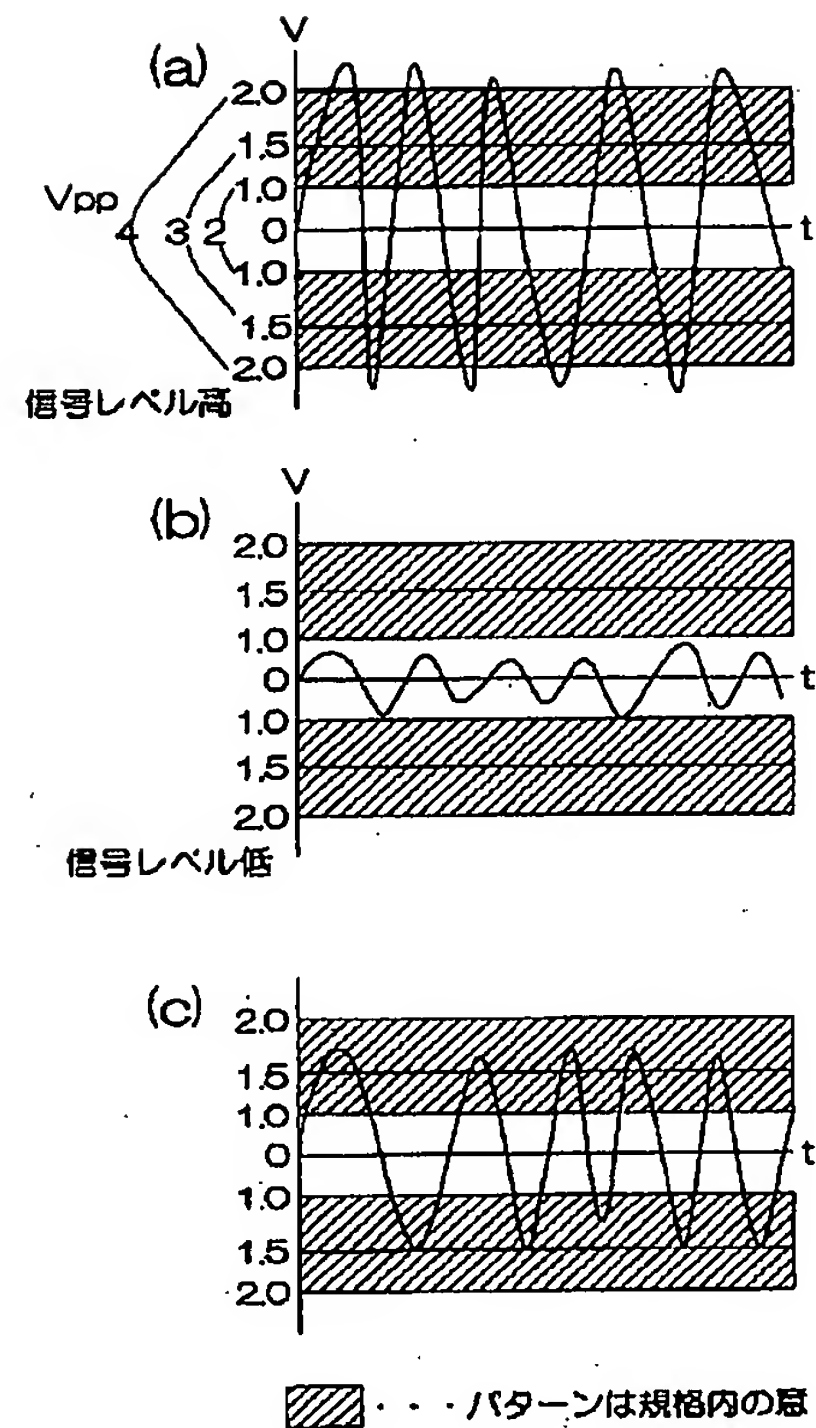
【図1】



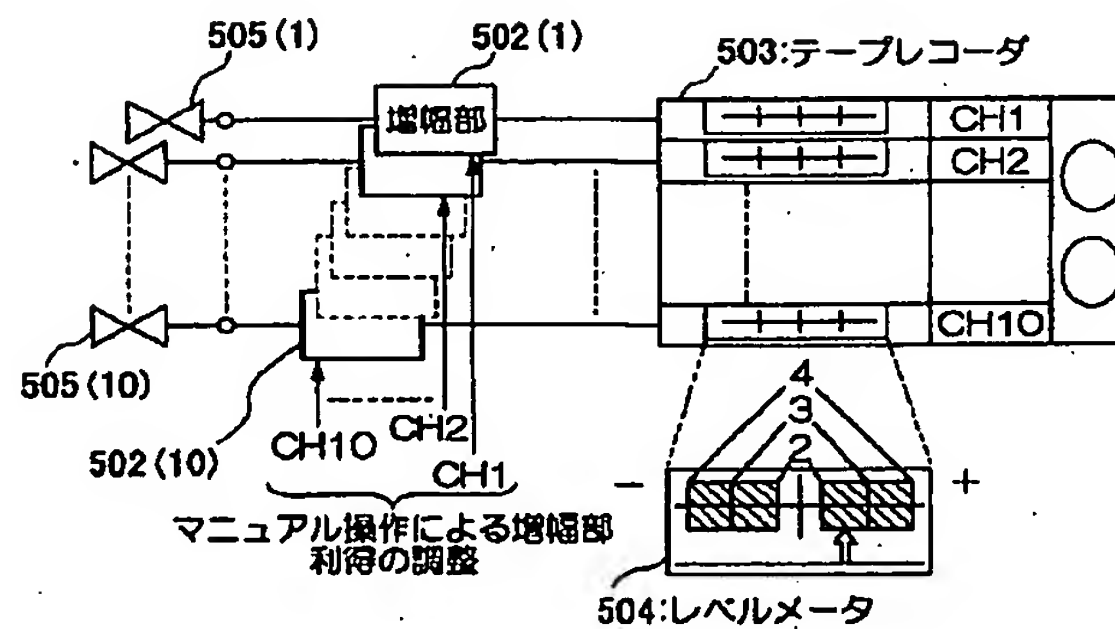
【図2】



【図3】



【図5】



【図4】

